

B. Life of an Island

I. Pretrip Activities: “Walking in their Footsteps”

- A. History of Native Peoples and Prophecies
- B. History of the Apostle Islands
- C. Fur Trade History

II. Field Trip Activities: “Immortal Trees”

- A. Old Growth Forest Hike

III. Posttrip Activities: “Do You Know a Champion Tree?”

- A. Island Geography and Geology
- B. Mapping of Islands
- C. Making a model of an Island
- D. Lighthouse Curriculum



Life of an Island Lesson Plans

Lesson Title I: “Walking in Their Footsteps”

B. Life of an Island (Pretrip Activity)

Early History of the Area (This lesson can be adapted to any region’s history).

Lesson Summary:

This lesson focuses on the Ojibwe settlement history of the area near what is now the Apostle Islands National Lakeshore. Students will learn about events prior to the arrival of people of European descent in the region.

Learning Objectives:

Students will:

- gain knowledge of the history of native peoples.
- be able to develop historical context for present day and more recent past events.
- explore issues of cultural contact, ownership, use and sharing of resources.
- gain an appreciation for traditional ways of living and of Wisconsin's (or any region's) Indian peoples.

Wisconsin Curriculum Standards Integration Reference:

English Language Arts Standard:

A. Reading/Literature: A.4.1, A.4.2, A.4.3, A.4.4/ A.8.1, A.8.2, A.8.3, A.8.4

B. Writing: B.4.1, B.4.2, B.4.3/ B.8.1, B.8.2, B.8.3

C. Oral Language: C.4.1, C.4.2, C.4.3/ C.8.1, C.8.2, C.8.3

Social Studies Standard:

A. Geography: People, Places and Environments: A.4.1, A.4.2, A.4.4/ A.8.1

B. History, Time, Continuity and Change: B.4.1, B.4.2, B.4.3/ B.8.1, B.8.2, B.8.3

C. Political Science and Citizenship: C.4.1/ C.8.1

E. Behavioral Sciences, Individuals, Institutions and Society: E.4.7, E.4.8, E.4.9, E.4.11, E.4.12, E.4.13, E.4.14, E.4.14/ E.8.3, E.8.6, E.8.9, E.8.10, E.8.12, E.8.14, E.8.15

Recommended Duration:

45 minutes to 90 minutes. Note this activity requires a lot of listening and discussion. It may be best if this lesson is split into two sessions if time goes beyond one hour.

Discussion Questions: (See Activities and Procedures)

- 1) Treaty issues past and present.

- 2) Compare the lives of early Ojibwe to our own and to the lives of lighthouse keepers (daily routine, entertainment, work, food, seasonal activities).
- 3) How do people keep their culture intact from generation to generation?

Resources and Materials:

Resources:

- The Mishomis Book - Edward Benton-Binnet; Chapters 13 and 14.
- Wisconsin Indian Treaties and Tribal Sovereignty - Classroom Activities -
- Wisconsin Department of Public Instruction.
- Contact your local tribal authorities.

Materials:

- overhead projector
- overhead map of migration
- colored dry erase markers
- student maps for each individual
- colored pencil
- log book page

Activities and Procedures:

- 1) Set historical context for students: (Note: Words in italics are for teacher's background. You may wish to read the paragraph verbatim. Discussion questions are indicated in bold.)

More than 1000 years ago, the Ojibwe - Anishinabe people left the Northeast coast of North America to begin a long migration to the promised land where prophecies told them that food would grow on water (Chapter 13 in the Mishomis Book). This journey finished in the area we now call the Apostle Islands.

Show students overhead of the map which shows the route that the Anishinabe traveled.

- 2) Activate Students' Prior Knowledge: It is important to point out that the States on the map did not exist at the time of the migration. "The United States has been an independent country for less than half as long as the migration of the Ojibwe people lasted. The migration took 500 years (Chapter 14 in the Mishomis Book). How long has the U.S. existed?"

Discussion Question: What do you think America looked like at this early time? We suggest that teachers permit students to discuss briefly in small groups or pairs and then share with the larger group.

Discussion Question: What do you know about the areas along the migration route today? Has anyone visited any of the Great Lakes or New England states? Permit 5-10 minutes of discussion. Allow students to come up and point to places they are familiar with on the map.

- 3) Expand on history to include cultural information and locations:

A. "The Ojibwe had a good life on the Northeast Coast. It was about 900 A. D.-- 600 hun-



dred years before Columbus arrived. Prophets came to the people and said that the Ojibwe must move to a land in the west where food grows on water. Ojibwe defined a good life as having plenty of food, fresh water, shelter and a safe place to raise their children. They were told they must move or they would be destroyed by the coming of the light-skinned race.”

Discussion Question: Ask students to imagine the church leader or mayor coming and saying that aliens will destroy us all if we do not leave our comfortable life and go to live on the moon. How would you react? Would you believe it? Would you go? “It is important to remember that for these Ojibwe, their spiritual leaders were highly revered and trusted. Spirituality was and is a major factor in everyday life. The people trusted their spiritual leaders enough to follow the suggestion.

Discussion Question: Compare your way of life to the past. How would you keep your way of life intact over such a long journey? How would you define “a good life”?

Discussion Question: How many people began the migration? Literally thousands. Refer to descriptions in the Mishomis Book p. 94 and 96. Many communities (towns) and different groups were involved.

B. Trace Route and Introduce Ojibwe lifestyle and language.

Use the map and have students follow along on their own maps. Start with stop #1. This is near what is now Montreal along the St. Lawrence River at the junction of the St. Francis River (the only river flowing westward).

Discussion Questions: What did they eat? How did they camp?

They probably fished, hunted, and ate foods they could gather. Homes had to be mobile (wigwams). “Duties were divided by bands. The Ottawa were responsible for gathering food and supplies. The Ojibwe were the spiritual or faith keepers. The Potawatami were in charge of keeping the sacred fires.”

Discussion Question: How does this separation of duties relate to the lighthouse keepers' jobs and to work within your community and family?

Stop #2-Niagara Falls. Use this stop as an opportunity to discuss Ojibwe place names versus present day place names. Niagara Falls is called Thundering Water in Ojibwe. Europeans who came later tended to name natural resources after people while the Ojibwe tended to name them after the natural characteristics of the place.

Discussion Questions: Can you think of other examples and/or exceptions to this statement?

Chicago is an example of a name that has been adapted from the Ojibwe language (from the word skunk) because it was a stinky place due to marshy bogs. Raspberry Island (Miskaminikan Miniss - island of raspberries) is one of several Apostle Islands whose names also derive from the Ojibwe language. Madeline Island is now named after a Chief's daughter who married one of the first fur traders in the area. The original name, Monigwungakawning- meant the place that was dug.

4) A. What was life in the Apostle Islands area like?

They ate wild rice, fish and hunted game. Their spirituality was tied to the natural world. There was no separation of what we would call religion and daily life. All parts of the natural world had their own life or spirit. These beliefs led to a way of life that we would call conservation. This was common for Native American tribes in North America. The lighthouse keepers had their own conservation code and their own set of rules to live by.

Discussion Question: What are the similarities and differences between life for the Ojibwe and the lifeways of early traders, missionaries and lighthouse keepers.

B. First Contacts/ sharing Resources.

When the first missionaries and traders arrived in about 1618, the Anishinabe had been here for over 200 years. Unlike so many other Indian Nations, the Ojibwe never fought with settlers. They always made agreements (called treaties) and have kept them. Treaties still govern the sharing of resources today.

Discussion Question: How do you think the Ojibwe shared resources when they first came into contact with European settlers? What cultural differences would they have had to cope with?

They would have shared knowledge about the area, fishing, technology (both ways), boat building, etc.. The two groups had different languages, religions, eating habits, etc.. You can use these to prompt students. They will probably come up with others. Chapters 13 and 14 of the Mishomis Book also discuss this.

Other Suggested Activities:

So many parts of this introductory lesson could be expanded into whole lessons and units on their own. Permit discussion as your time allows. Here is a list of other ideas to expand on the ideas presented here.

- Ojibwe names for islands and animals using the Mishomis Book Coloring Book.
- How native americans navigated between islands before lighthouses.
- Issues of race, stereotyping and cultural differences.
- Simulations involving first contacts between cultural groups.
- Related videos: Ikwe
- Visits to Madeline Island Historical sites.
- Visits from elders for storytelling, oral history
- Constitutional law and federal government issues. Read United States Constitution Article VI, Clause II, and ask the question "what does this mean to you?"

Evaluation and Assessment Procedures:

Evaluation for this lesson takes two forms. The first is a map activity stressing recall of the basic facts of Ojibwe history. The second involves having students reflect on the discussion and make entries in their student journals (the logbook). Teachers should look for creative applications of the introduced concepts. These assessments can be done at a separate time. The map assessment can probably be done as you go through the history and discussion.



- 1) Map Activity: Students identify and mark certain key landmarks and events on their maps.
 - a) Put a red circle around the region where Ojibwe lived before they migrated.
 - b) Put an x on the place where they first stopped along the St. Lawrence River.
 - c) Draw small fish shapes in the areas where you think they probably lived mostly by fishing (answers will vary).
 - d) Put a blue x on the stop number when they first reached Lake Superior.
 - e) Put a w on the spot where they found the food growing on water.
 - f) Trace the Ojibwe's main route(s) in green.
- 2) Logbook activity: Choose one of the following questions (or create your own and clear it with your teacher) and write a one paragraph answer.
 - a) How do you think you would you feel if your parents told you that the family would be leaving on a spiritual journey and that they had no idea where you might end up? What would you want to do to prepare? What would you say to your parents? your friends?
 - b) Imagine that you have been living in a small community all your of your life. (Perhaps you have.) Suddenly large numbers of strange visitors arrive and prepare to stay. How would you feel? What would you want to do? Say?

Work Book Log :

Date:

Temperature and Weather:

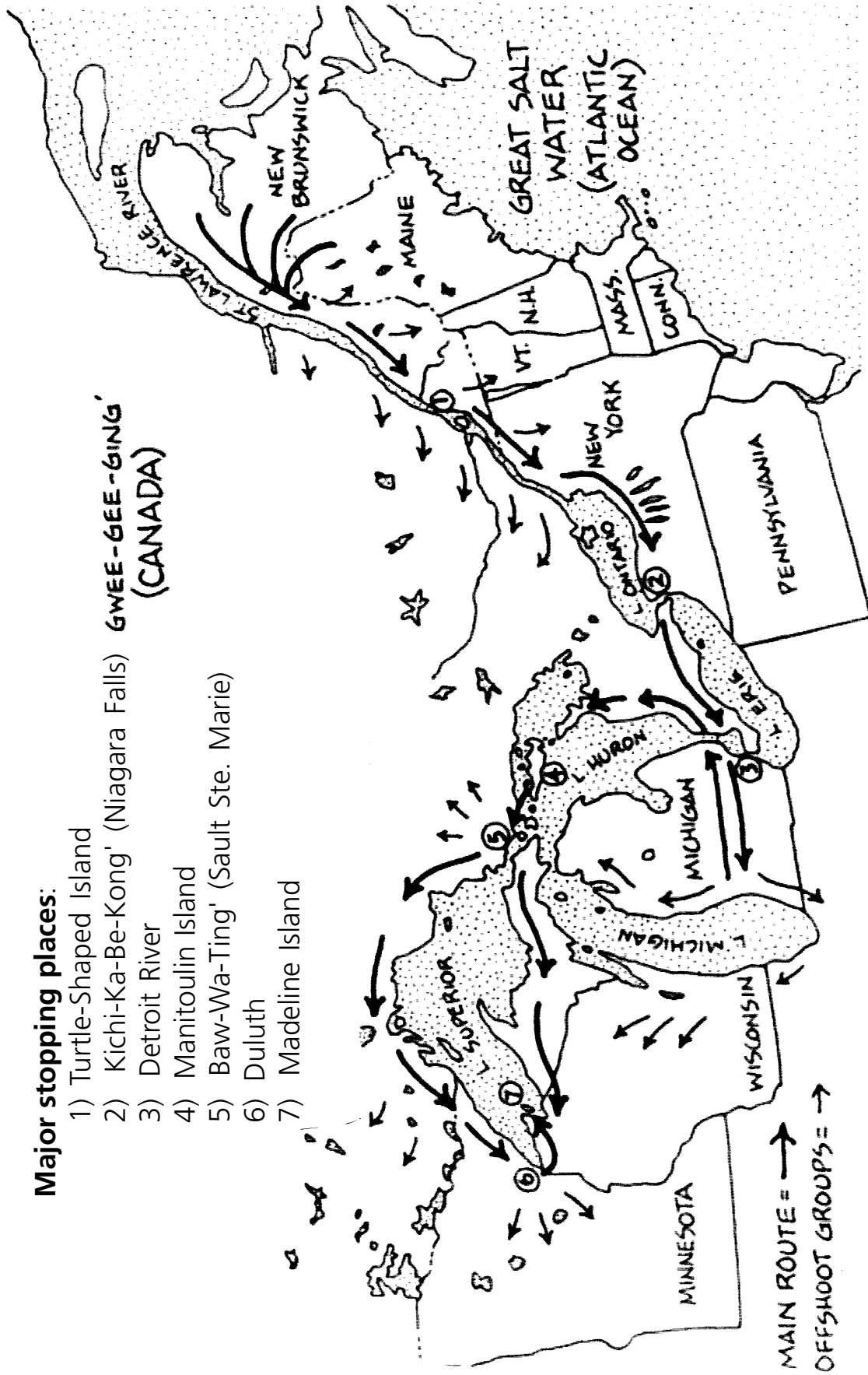
Duties and Activities:

Reflection and Observations:

The Migration Route of the ANISHINABE

Major stopping places:

- 1) Turtle-Shaped Island
- 2) Kichi-Ka-Be-Kong' (Niagara Falls) GWEE-GE-GE' (CANADA)
- 3) Detroit River
- 4) Manitoulin Island
- 5) Baw-Wa-Ting' (Sault Ste. Marie)
- 6) Duluth
- 7) Madeline Island



Life of an Island Lesson Plans

Lesson Title II: “Immortal Trees”

Lesson Summary:

This lesson focuses on the ecology of Raspberry Island and how it has changed over time (this can be adapted to your own particular region). The emphasis is on old growth forest as it relates to the pretrip lesson on Early History of the area. The continued existence of old growth forest on this island is directly related to the presence of the light station here. Students will also use math and science skills to measure the height, crown and circumference of old trees.

Learning Objectives:

Students will:

- gain knowledge about forest environments and what lives on Raspberry Island.
- draw a connection between changes in the environment and human habitation over long periods of history.
- be able to list 2 characteristics of an old growth forest.
- be able to name 2 things that have contributed to the loss of old growth trees.
- be able to collect scientific data in the field.

Wisconsin Curriculum Standards Integration Reference:

Math Standard:

- B. Number Operations and Relationships: B.4.1, B.4.3, B.4.4, B.4.5, B.4.6/ B.8.3, B.8.7
- D. Measurement: D.4.1, D.4.2, D.4.3, D.4.4, D.4.5/ D.8.1, D.8.2, D.8.3, D.8.4

Science Standard:

- B. Nature of Science: B.4.2, B.4.3/ B.8.1, B.8.2, B.8.6
- C. Science Inquiry: C.4.1, C.4.2, C.4.4, C.4.5, C.4.6, C.4.8/ C.8.1, C.8.2, C.8.3, C.8.11
- E. Earth and Space Science: E.4.1, E.4.3, E.4.8/ E.8.6
- F. Life and Environmental Science: F.4.1, F.4.2, F.4.3, F.4.4/ F.8.2, F.8.8

Social Science Standard:

- A. Geography: People, Places, and Environments: A.4.2, A.4.4, A.4.9/ A.8.4, A.8.10
- B. History-Time Continuity and Change: B.4.1, B.4.7, B.4.8, B.4.10/ B.8.7, B.8.8, B.8.11
- E. Behavioral Sciences-Individuals, Institutions, and Society: E.4.8

Recommended Duration:

30 to 60 minutes

Discussion Questions:

- 1) Imagine knowing these trees so well you could use them for navigation.
- 2) How do we balance the use of tree products with forest conservation?
- 3) How would you feel if the tree you selected was cut down? Fell down?

Resources and Materials:

Resources:

- Project Learning Tree
- Wisconsin's Champion Trees, WDNR
- NPS Tour Information
- Student Curriculum work from Apostle Islands School

Materials:

- map indicating where to leave trail and find old growth trees.
- list of species present emphasizing trees
- pencils and clipboards for students
- 12 inch rulers
- string and measuring tapes
- copies of tree measurement procedures
- recording sheets

Activities and Procedures:

Hike the trail from the lighthouse to the sand spit (or part way to the sand spit and back, as time allows).

Drawn from an activity developed by Jason Hicks for the Apostle Islands School program, Northland College, May 1998.

Prepare students for the walk by setting the stage: The walk usually starts on the lighthouse grounds and proceeds to the sandspit. The sandspit is approximately three quarters of a mile from the lighthouse. Due to time constraints you may choose to hike only part of the trail or to skip some of the stopping places on the walk so you have time measure some old growth trees. Students should form small groups, pick a tree and proceed to measure it following the directions on the handout. This is going to be difficult for the students because of the interference of undergrowth and other trees. In addition, the directions and steps are quite complicated. You might want to go over these directions before the walk, perhaps practicing on measuring the height of the lighthouse itself. Be ready to assist groups in understanding the steps and gathering data as accurately as possible.

- A. Handout copy of species list (one page), which will include plant species we are likely to see on Raspberry Island.
- B. Tell students that they can check off the different species when we see them on the walk and during the rest of their time on the island. Tell them that they will encounter more wildlife if they are quiet, watchful, and listen. Ask them to listen for things they normally hear in town to see if they can hear them on our hike. Pay special attention to the variety and size of trees.



- C. Ask students, "What is proper behavior on the trail?" (Stay on the trails, do not pick flowers or plants, follow the leader, listen while others are talking, and do not litter). There may be a time when we need to leave the trail. When not on the trail students should avoid walking in a straight line and should place their feet carefully so as not to disturb plant life. (*Note for teachers:* it is wise to leave one chaperone on the trail when you step off of it. Vegetation can be dense and students may need assistance returning to the main trail.) Conclude by telling the students they can and should ask questions at any time along the trail.
- D. "People throughout history have played an important role in this area's ecology. As we walk down the trail today, we will be walking through an old growth forest. It is very similar to the forest that the lightkeepers would have seen when they first built the trail over 100 years ago. It is similar to what native americans would have found here hundreds of years before that (refer to pretrip activity). This forest has not seen many of the changes that effected most of the other islands and much of the Wisconsin mainland because it was protected as a lighthouse reservation. Today's hike will not only allow us to learn about some of the characteristics of an old growth forest, but will also allow us to step back in time to see what much of this region may have looked like before settlers harvested and/or burned the forests."

Stop #1 The first stop will be at the edge of the lighthouse clearing. Ask the students what types of trees they see here and why the forest structure changes so abruptly as we go into the woods. Explain that the dominant species are quaking aspen and speckled alder, indicating that we have now entered an aspen-alder vegetation community. Also explain that the reason aspen are so prevalent is because they tend to flourish in heavily disturbed areas. Why is this area disturbed? Explain that this area was cleared by the lighthouse keepers for firewood, to improve visibility of the light, and to create a "yard-like" setting around the lighthouse. **All of Raspberry Island was established as a reserve for the use of the lighthouse keepers.** Trees were generally harvested for use in the area closest to the lighthouse. As we enter the forest we will be seeing some very old trees because the keepers never needed to cut most of the trees on the island. The reserve allowed most of the island to remain covered with old growth forest.

Stop #2. Ask students if they know what the evergreen shrub growing along the trail is. It is called Canada yew. It was found throughout forests in northern Wisconsin before deer populations increased. Have the students smell, feel, and look at the differences between balsam fir and Canada yew. Ask them what the differences are between the two. (The needles are longer on balsam fir and wider on yew, and balsam fir has a characteristic smell.) Then explain that yew is very important in providing habitat for both bird species and small mammals, largely by providing nesting cover. Yew is a favorite winter food for deer. It is now rare in northern Wisconsin because deer have eaten all of it. The presence of large numbers of deer can alter forest structure, eliminating important habitat for certain birds and mammals. Ask them if they think there are a lot of deer on Raspberry Island. Why aren't there deer on Raspberry?

Stop #3. Stop at the enormous yellow birch with the large gash in the trunk a short distance up the trail. First, ask the students how old they think the tree is. (Around 200 years old.) Second, ask the students what kind of tree it is. (Yellow birch.) It can be difficult to differentiate

between white and yellow birch when the tree is very large because lichens and mosses grow on the bark and disguise the bark's true color. Ask them what they think caused the gash in the trunk. The actual cause of this gash is unknown, but disease often causes huge holes like this to be formed. If you see a gash similar to this towards the top of the tree, it is often the result of a lightning strike. These gashes provide important habitat for wildlife including red squirrels, which are found on the island, and gray squirrels. Squirrels use these features to cache food, such as seeds and acorns.

Stop #4. Stop near an uprooted tree with the roots showing. Ask why trees like this can be found in an old growth forest. Explain that trees are killed by wind, lightning, and disease. Just because this is an old growth forest, that does not mean that trees do not die. Explain that these are typical types of disturbances in old growth forests. Areas like this that have not been logged by humans are considered to be old growth forests. This single death disturbance creates a small opening in the canopy which allows young trees to grow in the gaps and replace the old trees. It means that not all the trees that grow in an "old growth" forest are old. There is usually a mix of old and young trees. Some tree species, especially hemlock and yellow birch, sprout on the tip up mound or on the trunk of the downed tree, utilizing the nutrients from the dead tree and the soil surrounding its roots (look for a yellow birch that is growing on a log).

Stop #5. Stop where there is a medium-sized yellow birch immediately off the trail. Ask the students what type of tree it is. Explain that yellow birch can often be differentiated from white birch by the yellowish or bronze bark versus the whitish bark on white birch (hence the names "white" birch and "yellow" birch). Have the students notice if they see more white birch or yellow birch as they continue hiking along.

Stop #6. This area presents an opportunity to leave the trail and look for large trees. Lead students about ten feet northwest off the trail. You should see several very large trees. Tell students that you want to know how high the trees are. Can they guess? How could they measure the trees? Since we can't actually climb the tree to measure it, we will have to use another method. Hand out sheets of directions from the Champion Trees book. Students should form small groups, pick a tree and proceed to measure it following the directions on the handout. This is going to be difficult because of the interference of undergrowth and other trees. In addition, the directions are quite complicated. Be ready to assist groups in understanding the steps and gathering the most accurate data possible. Recognize that gathering data in the field is difficult and can be frustrating. To insure that they are careful, you may want to tell them that we will be looking for the biggest tree and will expect groups to prove that theirs is the biggest. After gathering the measurements, return to the boardwalk.

Stop #7 About halfway down the trail stop in the vicinity of the large sugar maple. Ask students to point out the biggest tree they can see from where they are standing and ask them what type of tree it is. Explain that if the leaves on the tree are not visible, they can often use the leaf litter on the forest floor to identify a tree. Have the students pick up a leaf or two on the forest floor, and ask what type of trees the leaves come from. In this case there are sugar maple leaves all over on forest floor indicating that this tree is a sugar maple. Explain the characteristics of a sugar maple leaf.



At this same location, ask them if they can identify any of the other trees around them. Point out the white birch and balsam fir. Ask them to identify the major difference between balsam fir and white birch. Balsam fir is an evergreen and white birch is a deciduous tree. An evergreen is a tree that keeps its needles all year round, whereas a deciduous tree loses its leaves during the fall. Balsam fir needles have a strong aroma, are relatively soft (unlike spruce), and only protrude from the sides of the branches (unlike spruce where they protrude all the way around the branch). This is called a white birch - balsam fir community. A tree species is a dominant part of a plant community when it is the most abundant species in a specific location. When two tree species are most abundant in a particular location they are co-dominant. Most forests in this area are generally mixed forests, containing both evergreen and deciduous trees.

Last Stop. The development of the Apostle Islands region and the harvesting of its resources actually led to the preservation of this small chunk of old growth forest. The construction of the lighthouse and establishment of the "lighthouse reservation" helped protect the "immortal trees" that you saw and measured today. Think about some of the similarities and differences between this forest and the forests near your homes. Practice the skills you learned today to measure trees near where you live. Perhaps you can find some that are even larger than the ones you saw today.

Beyond this point you will either continue to the sand spit (if time permits) or return to the lighthouse. Be sure to gather student data and checklists to save for the post-trip activity.

Other Suggested Activities:

- Read the Old Growth Essay (page)
- Logging, Forestry (many DNR materials available)
- Tree identification
- Current issues in the preservation of old growth species (California Redwoods, Washington logging). This would make a great current events newspaper search.
- Wood products
- Visit to Superior Water Logged Lumber
- Recycling Projects

Evaluation and Assessment Procedures:

Light keeper log books

Work Book Log :

Date:

Temperature and Weather:

Duties and Activities:

Reflections and Observations:

Check-off List for Trip Activity

Trees - Major

Cedar
White Birch
Yellow Birch
Balsam Fir
Spruce
Sugar Maple

Shrubs

Hazelnut
Elderberry (Red)
Canada Yew
Mountain Maple
Juneberry

More Plants - Non-native

Buttercups
Dandelions
Avenas
Agrimony
Self Heal

Plants

Spikenard
Clintonia
Rosy Twisted Stalk
Solomon's Plume
Sweet Cicely
Sasparilla
Weed Nymphs
Cow Parsnip
Jack-in-the-Pulpit

Pulpit Lighthouse
Nodding Trillium
Jewel Weed
Bayberry

Other

Oak Fern
Ostrich Fern
Sensitive Fern
Running Clubmoss

Near the Lighthouse

Golden Rod
Fireweed



Life of an Island Lesson Plans

Lesson Title III: “Do You Know a Champion Tree”

Life of An Island Posttrip Lesson

Summary:

Students will use data acquired on Raspberry Island to draw conclusions about old growth trees, compare old growth trees to trees in their area and discuss conservation and preservation issues relating to cultural and natural elements of all resources.

Learning Objectives:

- compile and compare data about tree size to evaluate the largest tree they saw on Raspberry Island.
- use measuring skills to compare these trees to other trees near their school.
- gain an appreciation for the size of old growth trees.
- discuss issues in conservation of historic resources and evaluate pros and cons, costs and benefits.

Wisconsin Curriculum Standards Integration Reference:

Math Standard:

- A. Mathematical Process: A.4.2, A.4.3, A.4.4, A.4.5/ A.8.1, A.8.2, A.8.4
- B. Number Operations and Relationships: B.4.1, B.4.2, B.4.3, B.4.4, B.4.5/
B.8.1, B.8.7
- C. Geometry: C.4.1/ C.8.1
- D. Measurement: D.4.1, D.4.2, D.4.3, D.4.4, D.4.5/ D.8.1, D.8.2, D.8.3, D.8.4
- F. Algebraic Relationships: F.4.1, F.4.2, F.4.3/ F.8.10

Science Standard:

- F. Life and Environmental Sciences: F.4.1, F.4.2, F.4.3, F.4.4/ F.8.10

Recommended Duration:

45 minutes to 90 minutes.

Discussion Questions:

Questions for discussion are listed when appropriate in the procedures for the activity.

Resources, Materials, and Appendix items:

Resources:

- Wisconsin Champion Trees 1998, Wisconsin Dept. of Natural Resources.
- Project Learning Tree

- Map from National Park Service

Materials:

- data from island measurements
- forms for recording measurements
- rulers
- clipboards
- string and measuring tape
- pieces of cloth or cones for crown measurement markers

Activities and Procedures:

A. Review the trip hike. Ask students to recall what they saw and learned. Remind them of the measurement activity that they did. Ask why we used the measuring techniques we used? You may want to discuss with students why it works to use a 12 inch ruler to determine the height of a large tree. Relate this to geometry. It has to do with equivalent triangles; if you can figure out the sides of a small triangle, and then make a bigger one with the same angles, the relationship between the sides will be the same.

B. Students should reassemble into their groups and make a final recording of all their data from Raspberry Island on a new record sheet. Be sure to tell them that their information will be given to the National Park Service for its use. The class will then work together to make a chart on the board listing all the trees and their final score. Which tree is the Champion? If students wish to send it in, they will have to compare it to other trees in the Champion Tree Book and see if it is big enough. Ask students if the activity made them think differently about those old trees or trees in general. Accept all responses.

C. Now students will take these newly acquired math skills and practice them again to measure trees around their school and/or home. You may want to use the same or new groups. Challenge students to find a Champion Tree in their neighborhood or town. Follow the same procedures for measuring that you used on the island walk. It should be much easier in town than on the island.

D. Students compile their data as before and make comparisons between the Raspberry Island trees and those around their communities. Discuss the differences and similarities. Discuss the characteristics of an old growth forest compared to one that has been managed. Areas to consider: diversity of age and species. What happens to dead trees? What other life grows-animals, plants, lichens?

E. Conclusions and Discussion of Stewardship Issues:

Ask students how they feel about preserving old growth after their trip and research? Why is it important? Why not? Explain that old growth forests are a resource (define "resource"). There are many kinds of resources. Can they name some? Be sure to add historical elements such as light-houses, the history of their keepers, and information about Ojibwe cultures and settlement. Ask the students if they think that these resources are worth preserving. Each student writes yes or no on a scrap of paper and turns it in. That way every student has to think about the question for him/herself. The anonymous totals are given. As a class then, you can proceed to make a chart of pros and cons



about conserving these resources. Benefits include historical knowledge to permit informed decision making, beautiful places to go, biological diversity, and availability of resources in the future. Cons include the high cost, possible interference with needs for food or products or even land for homes. You and your students can think of many others! You can address actual questions that are being considered today. For example, the National Park Service has asked for money to stabilize the eroding cliff in front of the Raspberry Island lighthouse. What if we decided we should protect every lighthouse in the nation from erosion? Could we do it? Can we afford to? Logging in the National Forests frequently involves issues relating to ecology and species preservation as well as cultural and economic concerns. Discuss with students the difficulty of dealing with these separately.

Other Suggested Activities:

- This lesson could be tied in with a unit on geometry.
- Logging history and current issues of economics vs. preservation
- Interview loggers and environmentalists about preservation and conservation.
- Use other activities from Project Learning Tree to expand on forest ecology.
- Study the age of trees by looking at cross-sections and tree rings.
- Visit the Superior Water Logged Lumber Co. to see some very old growth wood.
- Non-renewable and renewable resources.

Evaluation and Assessment Procedures:

Observation of students during measuring of local trees and finished Champion Tree Forms.

Work Book Log :

Date:

Temperature and Weather:

Duties and Activities:

Reflection and Observations:

How to Measure a Champion Tree

Circumference Measurement:

Using a flexible tape measure, measure the distance around the trunk of the tree to the nearest inch. This measurement should be taken at 4 1/2 feet above ground level. If the tree is on a slope, use the midpoint of the tree base to measure 4 1/2 feet above ground level. If there is a branch or growth on the trunk at 4 1/2 feet, measure the circumference just below the obstruction and report the height at which the measurement was taken. For multi-trunked trees that branch below 4 1/2 feet, report the circumference of the largest trunk at 4 1/2 feet. If a multi-trunked tree flares out at 4 1/2 feet, measure the smallest circumference below 4 1/2 feet and report the height at which the measurement was taken.

Height Measurement:

Take a 12-inch ruler and hold it vertically at eye level in an outstretched arm. Stand far enough away from the tree so that you can roughly see both the base and the top of the tree between the top and bottom of the ruler. Move forward or backward until the eye sights the base of the tree (A) across the 0 - inch gradation and the tip of the crown (B) across the 10 - inch gradation. Then a sight is taken across the one inch gradation and the corresponding point (C) is marked on the tree by a companion. Using a tape measure, measure the distance from the base of the tree to this point (A-C) to the nearest foot and multiply that measurement by ten. This is the height of the tree (A-B). If a height measuring instrument is available, its use is preferred. Be sure to report your method of measurement and have someone else verify your results.

Crown Spread Measurement:

Place a marker under the outside edge of the crown that is farthest from the trunk (A) and another directly opposite it at the outer edge of the crown (B). Next, set a marker at the edge of the crown that is closest to the trunk (C) and another at the outer edge of the crown directly opposite it (D). Using a tape measure, measure both the distance from A to B and the distance from C to D to the nearest foot. Add the two measurements together and divide the sum by two to obtain the average crown spread.

Point Value:

The total point value, according to American Forests, is calculated as follows:

$$\begin{aligned} \text{Total Points} &= \text{Circumference in inches} + \text{Height in feet} \\ &+ 1/4 \text{ of Average Crown Spread in feet.} \end{aligned}$$



Old Growth

“Slowly, slowly they return
To the small woodland let alone
Great trees, outspreading and upright
Apostles of the living light.”
- Wendell Berry

When we think of old growth forest, we usually conjure up images of vast forests in the Pacific Northwest. In the Apostle Islands, however, remnants of Midwestern virgin forests can still be found.

Prior to 1905, northern Wisconsin still had 2.1 million acres of old growth forest. Public concern to preserve these pristine forests existed and a bill to make the virgin stands into state or national reserves was debated. The bill failed to pass so most of these remaining acres were clearcut and/or burned. Cutting began early in Apostle Islands forests. Proximity to the lake made the resource easy to transport. Even so, a handful of old growth stands remained untouched. Most of these stands were on islands with lighthouses.

When lighthouses were established on the islands, land was acquired as a reserve around the station so that the keepers had access to wood for fuel. No one was allowed to cut trees on the reserve except the lighthouse keepers. Inadvertently, the keepers protected these virgin stands. Raspberry and Devils islands were small enough that the entire islands became lighthouse reserves. Larger islands like Outer and Sand had 200 to 300 acre areas reserved adjacent to the lighthouses. If you are hiking on a trail near these lighthouses today, you can expect to see some big trees.

Big trees. White pine, hemlock, yellow birch, cedar, maple, oak, paper birch, balsam fir. Although each of these may be found in virgin forest, certain species usually predominate. Large white pine and hemlock are found in the reserve areas on Sand and Outer islands. Three or four people must hold hands to encircle some of the tree trunks. Moist conditions on Raspberry Island are more favorable for yellow birch and cedar. Harsh conditions at Devils Island favor boreal forest species like paper birch and balsam fir.

How old are these trees? Core samples of some of the hemlocks on Outer Island show them to be more than 300 years old. As you look through old growth forest you find many leaning and downed trees. They may take hundreds of years to fully die and decompose. Cedar, the tree of life, sometimes falls in such a way to allow its branches to grow into whole new trees. For cedar, immortality is a theoretical possibility.

Dead trees give birth to new life. Insect homes, moss, lichens, fungus. Mycelium, the thread-like roots that give rise to mushrooms, run throughout the undisturbed duff and rotting wood. Over 200 species of mushrooms have been identified on Raspberry Island alone.

Many creatures make their home in old growth forests. Chimney swifts, usually thought of as city birds, abound in the remotest parts of these forests. Standing hollow trees, their original homes, serve the same purpose as chimneys. Bat populations thrive in old growth due to the abundance of natural roosts. Salamanders, red-backed voles, fungus beetles, pileated woodpeckers, winter wrens, red squirrels, foxes, and snails all utilize fallen and standing dead trees for their homes. Tipped up

roots can provide winter dens for bears. Some tip ups are over 10 feet in diameter. What is it like to go off trail into these virgin areas? Vegetation is often dense and the going is hard. In many areas this is due to the presence of yew. Canada yew is common, as it once was throughout much of northern Wisconsin. It can grow twelve feet high, with roots so thick they can hold a person's weight a foot off the ground.

Entering the old growth forests of the Apostles, one can glimpse what once spread across the northern part of the state. Shadowy, thick forests, soft with duff underfoot. The sweet smell of decaying leaves and cedar. Snapping twigs with every footstep. Tall stumps like totem poles. Fallen trees so abundant, you can create your own path by following overlapping logs. Some logs so decayed, they are mere mounds. Laying down here you realize how everything is interconnected. Death and life, darkness and light, ancient and young, quiet and song.

